DOCUMENT RESUME

ED 294 461 FL 017 397

AUTHOR Forner, Monika
TITLE Tutorial Questions in Caretaker Speech.
PUB DATE Dec 87
NOTE 47p.; Paper presented at the Annual Meeting of the Linguistic Society of America (San Francisco, CA, December 27-30, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Bilingualism; *Child Caregivers; Child Language; Difficulty Level; English; German; Grammar; *Language Usage; *Questioning Techniques; *Sentence Structure; Toddlers

ABSTRACT

Statistical analyses of the incidence of "what"-questions requiring variably complex responses are presented. The responses were asked of a bilingual child by different sets of caretakers in English and German over a one-year period starting at age 16 months. Results show that the caretakers' questions are geared first toward the child's production of noun phrases (NPs), then of verb phrases (VPs), and finally of full sentences (S). Furthermore, within questions calling for NP responses, questions to be answered with simple NPs precede questions requiring complex NP responses and questions containing the copula precede questions containing a wide variety of lexical verbs. In terms of both the child's production and comprehension abilities, both sets of caretakers systematically shift their questions from the simple to the more complex over time. Four pages of references, eight tables, and four figures are included. (MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED294461

TUTORIAL QUESTIONS IN CARETAKER SPEECH

Monika Forner

Department of Linguistics

Macalester College

1600 Grand Avenue

St. Paul, MN 55105

USA

Presented at the LSA/AAAL/Ads Annual Meeting
27-30 December 1987
San Francisco, California

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

M. Forner

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✔ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

FL017397

TUTORIAL QUESTIONS IN CARETAKER SPEECH

Abstract

Statistical analyses of the incidence of *what*-questions requiring variably complex responses, asked of a bilingual child by different sets of caretakers in English and German over a one-year period starting at age 16 months, show that the caretakers' questions are geared first toward the child's production of NP's, then of VP's, and finally of full S's. Within questions calling for NP responses, furthermore, questions to be answered with simple NP's precede questions requiring complex NP responses and questions containing the copula precede questions containing a wide variety of lexical verbs. In terms of both the child's production and comprehension abilities, then, both sets of caretakers systematically shift their questions from the simple to the more complex over time.

TUTORIAL QUESTIONS IN CARETAKER SPEECH

Although not only in Western societies but also among people as diverse as the Berber and Comanche the most frequent answer given by mothers when asked why they modify their speech to language-learning children is "To teach them to talk" (Bynon 1968, 1977; Casagrande 1948; Ferguson 1977), the question of maternal language-teaching intentions has never been submitted to scientific scrutiny. In fact, this answer is generally not even taken seriously. For example, Brown (1977: 14) seems to attribute this response to some kind of wishful thinking on the part of mothers when he claims that they "credit (themselves) with a too pedagogical motive", Newport (1977: 213) clearly questions the truthfulness of the answer when she claims that "Motherese ... is a language for the convenience of the mother, not for the education of the child", and even proponents of the hypothesis that the input the child receives bears a relationship to the child's output feel compelled to repeatedly assert, as for example Furrow and Nelson (1986: 165) that "our hypothesis presupposes no answers to the questions of mothers' intent in modifying their code."

This paper is a first attempt to investigate caretaker-child linguistic interaction under the basic assumption that mothers speak the truth when they claim that they try to teach their children to talk. More specifically, this research is intended to provide supporting evidence for the First-Language Tutoring Hypothesis:

> In the home environment of the child learning a first language, caretakers structure some of their discourses with the child, and their utterances occurring within these discourses, in such a way that the child is systematically taught a particular curriculum, proceeding from the simple to

the more complex, over time.

This assumption of deliberate language tutoring will to a large extent determine the selection of subjects to be investigated as well as the nature of the data on which the investigation is based in the following way:

Firstly, if caretakers more or less consciously provide young language learners with individualized instructions, they will base their language drills, test questions, and language modeling behavior on the state of any given child's current knowledge, not only in terms of production but also of comprehension ability, at any given point in time and will, in addition, also take the child's interests and dispositions into account. This means that one should expect significant child-listener effects on the speech of a language-tutoring adult. If one were to do cross-sectional studies of adult language-tutoring behavior, therefore, one would have to be able to keep not only initial language production abilities constant across child subjects but also cognitive abilities, on which comprehension is based to a very large extent, as well as interest in learning, attention span, learning strategies, and dispositions. This would be necessary in order to control for child variables in a study investigating possible effects of differing adult tutoring behaviors on the language of children. For these reasons, i.e. in order to compensate for such child-listener variables, the subject of the present study is a bilingual child. As already noted by Slobin (1973), infant bilingual childrens' general cognitive maturity, as opposed to their linguistic maturity in any one language, cannot be assumed to differ according to which language they happen to be using at any one time; in a similar vein I assume that a bilingual child's basic personality traits, interests, and dispositions do not change with the use of different languages and that therefore, if a bilingual child is

investigated, non-verbal child behavior could not possibly influence the results of the investigation.

Secondly, if caretakers more or less consciously provide young language learners with individualized instructions, they will not do so on a twenty-four hour basis. Not only is it difficult to keep a very young child's attention focused on the same task for any extended period of time but also good tutoring requires a high degree of concentration on the part of the teacher, which busy caretakers of toddlers might have difficulties to sustain. An examination of the total of an adult's child-directed speech, therefore, cannot be expected to yield clear evidence of tutoring, because the "miniature language lessons" which a child might be subjected to would be buried, so to speak, in general conversation. For this reason an attempt is made in the present study to distinguish tutorial interactions from general, non-tutorial conversation, and the data base for analysis is limited to speech occurring within the former but not within the latter situations.

Thirdly, if caretakers more or less consciously provide the young learner with individualized instructions, it should be expected that they introduce a particular linguistic curriculum which starts with simple structures and systematically proceeds to more and more complex ones, and that they would employ language drills and test questions to practice this curriculum. In the first-language classroom, where the young learner is not aware that he is practicing or being tested, such tutoring behavior would have to employ specific kinds of information questions which necessitate specific kinds of linguistic structures as response. For example, the most frequent answer to a where-question is a prepositional phrase, to a why-question an adverbial clause introduced by because, etc. By asking different wh-questions, then, a questioner controls to a large extent the syntactic structure of the

appropriate response, a fact which might be exploited by first-language tutors in practicing and testing particular syntactic constituents. One kind of wh-question, namely what-questions, has been recognized to be particularly frequent in speech directed to young children (Savic 1975; Forner 1979) and to be used by adults as "test questions" to elicit information from the child which is already known to the questioner (Holzman 1972; Snow et al. 1976); this particular kind of wh-question also admits a wide variety of structurally diverse responses varying in syntactic complexity. For these reasons the data on which the present investigation is based consist of all and only those "verbal behavior episodes" (Moerck 1976) between caretaker and child which are introduced by a what-question under the assumption that if language tutoring is to be found at all during the interactions of language learning children with their caretakers it should be found in these particular episodes.

The subject of this investigation is my older son, Sean, whose language development was followed closely in a longitudinal study. Sean, an only child during the extent of the study, was raised from birth bilingually in this country with equal exposure to German, the only language spoken within the nuclear family during weekends and during mornings and evenings on weekdays, and English, introduced by a succession of monolingual female American college students who cared for Sean in his home during weekdays. These babysitters had had no training in linguistics and had not been instructed how to linguistically interact with Sean; in fact, I purposely never discussed Sean's language development in English with any of the sitters. Natural unstructured conversational interactions between Sean and his mother in German and a total of nine different babysitters in English were recorded on audio tape for forty-five minutes per language per week over approximately a one-year period, starting when he was not quite

seventeen months old. Forty-six tapes per language were analyzed; these are subdivided into four time periods of three months duration each with an average of eleven tapes used per language per time period. All verbal behavior episodes centering around a topic introduced by a what-question were excerpted from these tapes, transcribed, and subjected to analysis.

The basic question to be investigated in the present study is whether or not caretakers systematically employ tutorial questions during natural conversational interactions, i.e. whether or not they use questions which might function as test questions or language drills. Since specific language drills have never been discussed in the literature on first language development, recourse is taken here to second language instruction in order to develop a feeling for what language drills consist of and look like.

In the modern second language classroom the concept has become widely accepted that it is the ultimate goal of language instruction to establish communicative competence in the learner. Toward this goal a succession of different language drills proposed by Paulston and Bruder (1976) for use in ESL classes is widely employed. These authors suggest that the teacher should first establish knowledge of a particular response type in the student by means of so-called "mechanical" or "meaningful" drills, i.e. drills during which the (only) correct answer to a drill-question is known by the teacher and cued by either the teacher herself or by the situational setting and no new information is thus conveyed in even an appropriate response to the question (e.g., "What color is your shirt?"). In this way, the student can concentrate on the form of the response without having to worry about the content. Once knowledge of a new structure has thus become established by means of mechanical or meaningful drills, the teacher should then help the student to transfer this knowledge to truly

communicative situations by means of so-called "communicative" drills, during which the teacher still controls the form of the appropriate response but not any more its content because she knows only a general range of correct responses but not the specific response appropriate to the given question (e.g., "What color is your car?"). In this way, the student now learns to encode a piece of information previously unknown to his questioner into an appropriate form.

Since the establishment of communicative competence in the young learner is very probably also the ultimate goal of the first language tutor, the following Corollary Hypothesis A, paraphrased from Paulston and Bruder (1976), would follow from the general first language tutoring hypothesis if language tutors in the home follow a similar progression from mechanical and meaningful to communicative drills as modern second language teachers:

> Tutoring changes over time from language drills during which a basic knowledge of particular response types is established to language drills during which this knowledge is transferred to appropriate communicative situations.

In order to test this hypothesis, all adult what-questions initiating a verbal behavior episode were subdivided into the following three non-overlapping categories:

1) Strictly tutorial (ST) questions

It has long been recognized that the equivalent of "mechanical" or "meaningful" drills does indeed occur in caretaker-child interactions, namely the multitude of questions asked of young children to which the questioner already knows the answer (Holzman 1972; Lord 1976; McDonald and Pien 1982; Moerck 1976; Sheldon 1979; Snow 1976; Snow et al. 1976). Researchers generally agree that these questions do not serve any communicative function but that instead they are truly tutorial, posed "to instruct the hearer socratically" (McDonald and Pien 1982: 344) or

"designed to display or test the knowledge of the hearer" (Holzman 1972: 317). The defining criterion for this category is that the questioner already knows the exact correct response to the question; for the vast majority of instances of questions falling into this category it also holds true that the correct answer is cued by the immediate (verbal and/or non-verbal) context, as, for example, in the following episode:

Example A1:
Translated from German, Time Period III, Tape #5
(referring to a ball the child is playing with)

Adult: What color is that ball?

Child: Yed color.

Adult: Red color? Well, about halfway, right? It's orange. Like the orange juice. Right? A color like the orange juice. Orange.

2) Loosely tutorial (LT) questions

There are in caretaker-child interactions also a large number of questions asked of the child to which, although the caretaker does not know the exact answer, a general range of possible responses is nevertheless known to her by virtue of her being an intelligent adult; furthermore, although some new piece of information might be conveyed by the child's reply, it is very questionable whether the adult really asked the question in order to receive this piece of information. In many instances the purpose of these questions appears to be only to get the child to talk at all costs, even if he is asked about and subsequently talks about a piece of irrelevant trifle. The defining criterion for this category of "loosely tutorial" questions, which are equivalent to communicative drills in the second language classroom in

that the questioner controls only the form but not the content of the response, is that the response is not cued by either the questioner or the situation and that the child's answer does not lead to any action response on the part of the caretaker. Examples of episodes initiated by loosely tutorial questions are provided in the following:

Examples:

A2, translated from German, Time Period IV, Tape #14

(referring to a ball at somebody else's home)

Adult: What color is it, the big ball of Becky's and Chris's?

Child: Oh . . .

Adult: Huh?

Child: Oh I not know.

Adult: You don't know?

Child: No. (pause) It dwine.

Adult: What is fine?

Child: Deen.

Adult: Green?

Child: Green.

Adult: Green is that ball?

Child: Yes.

Adult: Good. Fine!

Child: Black is the ball.

Adult: Black???

Child: Black is the ball?

Adult: Becky and Chris have a black ball?

Child: Yeah.

A3, English, Time Period IV, Tape #12

(Stevie is a little boy the child just mentioned; the adult has

never even heard the name before)

Adult: What does Stevie s mother look like?

Child: Uh . . . uh . . . Mrs. McCollar?

Adult: Yeah, what's she look like?

Child: Gween.

Adult: She's green! Does she look like your mother?

Child: Yeah, like my modder.

Adult: Oh.

3) Non-tutorial (NT) questions

It should be expected, of course, that in normal everyday interaction with young children adults also ask questions because they genuinely expect a new piece of information to be conveyed by the answer. All questions which are clearly posed because the adult wants to know how to best accommodate a need or wish of the child I regard to be strictly communicative rather than tutorial. Examples of such questions are "What do you want to have for dinner?", "What do you want to do now?", "What story do you want me to read?", "What is hurting?", "What's the matter?" etç. The defining criterion for non-tutorial questions is that the adult genuinely does not know the answer and that the child's response will initiate some specific piece of behavior on the part of the adult.

The null hypothesis, i.e. that caretaker-child linguistic interaction does not contain language tutoring episodes, would predict that strictly tutorial, loosely tutorial and non-tutorial questions should be randomly distributed throughout the corpora. Any systematic increase in the use of loosely tutorial questions at the expense of strictly tutorial questions over time, on the other hand, would support the tutoring hypothesis, which predicts that "easy" questions, i.e. questions to which the correct answer is being provided for the child,

should be replaced over time by more "difficult" questions, i.e. questions to which the child has to find the answer without aid from the environment.

The incidence of these three different question types in the two corpora for each of the four time periods is given in Table 1. In order to more easily observe the differences in distribution of the categories over time, the same data are presented as percentages of use of each category per time period in Table 2; this table is converted into graphic form in Figure 1. Statistically significant differences across languages are indicated in the Figures by +, while differences which do not quite reach significance, with $p<.10$, are indicated by (-).

[Insert Tables 1 and 2 and Figure 1 approximately here.]

The data show a distinct shift over time from strictly tutorial to loosely tutorial questions, while the incidence of non-tutorial questions remains constant over time in German and decreases slightly in English. The overall difference in the relative distribution of categories at different time periods within languages is highly significant for both corpora (chi squared=190.95. df=6, $p<.001$ for German, chi squared=119.89, df=6, $p<.001$ for English). Across languages, however, no statistically significant differences exist in the relative distribution of categories at any time period with the exception of a slightly higher incidence of strictly tutorial questions in German than in English at Time I (chi squared=6.00, df=1, $p<.025$).

The occurrence of non-tutorial questions is clearly independent of the other two question types, while among the latter loosely tutorial questions systematically replace strictly tutorial questions in both languages. Because of this distributional independence of NT questions, which might be considered the only "real" <u>what</u>-questions a

caretaker asks a child, from questions which either exhibit explicit teaching behavior on the part of the adult (i.e. ST questions) or at least might function as teaching devices in that they still resemble language drill questions posed in the formal classroom (i.e. LT questions), verbal behavior episodes initiated by NT questions will for the remainder of this investigation be omitted from the data base. The following discussion of possible language tutoring in the preschooler's home environment will thus be based on only those verbal behavior episodes which at least might be "miniature language lessons" and will disregard those which most probably are not.

With respect to the two categories of tutorial questions the present analysis shows that both sets of caretakers independently and quite naturally seem to follow a curriculum involving different types of language drills which is very comparable to the one introduced prescriptively into the second language classroom by Paulston and Bruder (1976) and at present followed in many modern foreign language and ESL instructional settings: Questions referring to the immediate context, in which the questioner controls both the form and the content of the answer and this content is also cued by the immediate situation are replaced over time by questions referring to deferred contexts, in which the questioner controls only the form, but not the content of an answer which the learner has to provide in the absence of cues from the environment. This sequence allows the learner to concentrate on the form of his answer in the beginning while the content is being provided for him but forces him later to transfer this knowledge of form to appropriate communicative situation in which he also has to supply the content of the response by himself. In terms of different language drills, then, the home environment of the language-learning child is indeed similar to a structured second language classroom.

However, the tutoring hypothesis would not only predict that

learning proceeds from cued response drills to drills allowing choice of response on the part of the learner, but it also presupposes a well-defined curriculum in terms of "easy", or simple, syntactic structures to be taught prior to "difficult", or more complex, ones. It is assumed here that in any hierarchically ordered syntactic structure any constituent X is simpler than any constituent Y such that Y contains X in addition to some other constituent. Under this definition of simplicity, noun phrases are simpler than verb phrases because verb phrases contain noun phrases but not vice versa, and both are simpler than sentences, which contain both noun phrases and verb phrases and are contained in neither. Similarly, within noun phrases those containing but a single noun are simpler than those containing both a noun and a nominal modifier, e.g. an adjective or a compound operator. In this way, two particular complexity hierarchies can be established and the caretaker-child data can be investigated with respect to whether or not these complexity hierarchies are taught step by step.

The following additional Corollary Hypothesis B will therefore be investigated:

> The elicitation of the child's "practicing" of different utterance types through questioning on the part of the caretaker should be structured over time according to a particular curriculum, from the simple to the more complex, with respect to the structure of the minimally acceptable response.

This hypothesis implicitly presupposes the major tutoring device used by adults to facilitate young children's language learning to be the use of question-answer sequences in discourses. There are several pieces of indirect evidence to support this assumption: First, the fact that child-directed caretaker speech contains a much higher proportion

of questions than is typically found in adult conversations has been among the earliest and most frequent observations made about adult-child linguistic interaction (Broen 1972; Drach 1969; Nelson 1973; Remick 1976; Sachs et al. 1976; Snow 1972, 1976). A possible function of this multitude of questions might be the elicitation of exactly those particular constituent types which constitute minimal acceptable answers to the questions. Second, it has been observed that frequently caretakers answer their questions themselves if the child is unable or unwilling to supply the correct response (Moerck 1976; Sheldon 1979; Snow 1976). A possible function of such responses might be the modeling of exactly those particular constituent types which constitute minimal acceptable answers to the questions. Third, it has been argued that a child might learn particular constituents through the distributional analysis of discourse sequences in which the mother alters at least one major constituent of her own preceding utterance and thereby provides contrasting data for the child's structural analysis of the input (Hoff-Ginsberg 1981). If this suggestion were expanded to view the total of children's early language experience in terms of "distributional privileges of occurrence" of particular syntactic ~~of~~ constituents within discourses, rather than in terms of the privileges of occurrence of form classes within sentences as proposed by Maratsos and Chalkley (1980), a method could easily be envisaged by which the child could learn to distinguish between different form classes from the earliest stages of productive language even in the absence of innate knowlege of syntactic categories, because during discourse different lexical categories constitute acceptable and "sensical" answers to different questions. For example, a noun, the simplest type of noun phrase, could be distinguished as anything that, in isolation, might be used as an acceptable answer to the question "What's that?", an adjective could be recognized as anything that can be

used, in isolation, as an acceptable answer to the question "What is the N?", and a verb, or a verb phrase, is the only constituent that can be used, in isolation, as an acceptable answer to the question "What's he doing?". Finally, on a larger scale, a full declarative sentence constitutes the only acceptable answer to the question "What's happening here?".

Apparently, universal properties of languages support this suggestion at least to some extent. In a very thorough examination of morphosyntactic marking of lexical items in a large number of unrelated languages Hopper and Thompson (1984) found that form-class membership cannot be assigned within sentences to lexical items on the basis of morphosyntactic markings which indicate whether something is a noun or a verb, but that "noun-ness" or "verb-ness" is assigned to basically acategorical lexical items through morphosyntactic markings on the basis of their functions in discourses. It is interesting to note that the function in which a form universally is marked most characteristically as a noun is when it is used to initially introduce a potentially "discourse-manipulable constituent", and that the function in which a form universally is marked most characteristically as a verb is when it is used to "report an event". These two functions of lexical items in discourses can be most easily elicited through a question like What's that? for nouns and a question like What is X doing? for verbs. The most logical way, then, to teach children first a basic distinction between forms exhibiting either "noun-ness" or "verb-ness" and subsequently to combine these two most basic lexical categories into the simplest sentence type would be, universally, to first ask the child to introduce a "discourse-manipulable constituent" (What's that? A boy.), to subsequently ask him to "report an event" in which this constituent is involved (What's he doing? Eating.) and then to induce him to combine the two (So what's happening there? The boy is

eating.).

Lord (1976) mentions anecdotally that all three mothers she observed longitudinally interacting with their children appeared to use these three different question types at different stages of their children's linguistic development and in the order given, i.e. "What's that?" earlier than "What's he doing?" earlier than "What's happening?", and suggests a closer investigation of this phenomenon. Since these question types are exactly those that would be used to introduce noun phrases, verb phrases, and sentences, i.e. the constituents of the first complexity hierarchy discussed above, the tutorial questions in the present corpora were analyzed in terms of the relative frequency of occurrence at different time periods of the following three categories of tutorial what-questions:

Curriculum 1. Categories within tutorial what-questions

1) Noun phrase (NP) questions

This category consists of questions to which either a noun phrase in isolation or a predicate adjective in isolation forms the minimally acceptable response. No difference is made here between simple and complex noun phrases. Some examples of noun phrase questions are the following:

Examples:

B1, English, Time Period II, Tape #2

Adult: What's that?

Child: M bow.

Adult: Yeah! Boat!

Child: M boot.

Adult: Boat.

Child: M boat, m boat.

Adult: Yeah yeah. Mm-hmm. They're going fishing in the boat.

B2, translated from German, Time Period II, Tape #6

Adult: What is that?

Child: Fly.

Adult: Yes, and what is the fly?

Child: Dead.

Adult: Yes, exactly. So what is that?

Child: Dead.

Adult: Mm-hmm. Dead what?

Child: Fly.

Adult: A dead fly. What is it?

Child: Dead fly.

Adult: Yes, you see? Great! Now we're gonna throw that dead fly here out.

2) Verb phrase (VP) questions

This category incorporates those questions which must be answered appropriately with at least a verb phrase; a noun phrase response to these questions would not be acceptable in adult usage. On the other hand, a full sentential response is not necessary. Some examples of verb phrase questions are given in the following:

Examples:

B3, English, Time Period III, Tape #9

Adult: What's the mouse doing?

Child: Eat.

Adult: Eating cheese. Yeah!

B4, translated from German, Time Period IV, Tape #5

Adult: What's it doing?

Child: Crying.

Adult: No. What's it doing?

Child: Seeping.

Adult: Yeah. Right.

Child: In owns bed.

Adult: In its own bed, yeah.

Child: N chinnen seep in own bed.

Adult: The other two children also sleep in their own beds, yeah.

3) Sentence (S) questions

The category of sentence questions comprises all those questions to which neither a noun phrase response nor a verb phrase response would be appropriate but which must receive a full sentential reply, as exemplified in the following episodes:

Examples:

B5, English, Time Period IV, Tape #4

Adult: Oh now, Frosty the Snowman, what happened to 'em?

Child: The ha fell down.

Adult: Yeah, his hat fell off. Now what's happening?

Child: The hat fell off.

Adult: Yeah. Where did Frosty the Snowman go?

Child: Where go Frosty the Snowman go?

Adult: Yes, he melted.

B6, translated from German, Time Period III, Tape #3

Adult: What's happening here?

Child: (no answer)

Adult: What's happening here?

Child: (no answer)

Adult: Tell me.

Child: Uh . . . uh . . . bus driver yelled.

Adult: Mm-hmm. The bus driver yelled. Yeah, he yelled at the three little piggies. Why, what did they do, the piggies?

Child: Cwied.

Adult: They cried so much that they were much too noisy, and then the bus driver got mad and yelled, and then the little piggies had to . . . ?

Child: Get . . . off.

Adult: Right.

The null hypothesis would predict these categories to be randomly distributed throughout the four different time periods. However, according to Corollary Hypothesis B, which predicts the teaching of a curriculum from the simple to the more and more complex, it should be expected that over time noun phrase questions, the simplest question type in terms of the minimally acceptable response, should be replaced first with verb phrase questions and then with sentence questions, i.e. with question types necessitating ever increasing syntactic complexity of the minimally acceptable response.

The raw data for this analysis are provided in Table 3. The distribution of categories in terms of percentages is shown in Table 4, while a graphic rendition of Table 4 is given in Figure 2.

[Insert Tables 3 and 4 and Figure 2 approximately here.]

As predicted by the tutoring hypothesis, and very similar to the results for strictly versus loosely tutorial questions, a general shift

is found in both the English and German data from NP questions to VP questions to S questions over time, which proves to be highly significant for both corpora (chi squared=168.53, df=6, p<.001 for German, chi squared=53.29, df=6, p<.001 for English). Contrary to the analysis of tutorial questions, however, where hardly any differences were found between the caretaker data across languages, the present analysis shows that the relative distribution of question categories requiring differentially complex responses varies considerably across languages at different time periods. At Time II, a trend in German toward slightly more VP questions only approaches significance (chi squared=3.35, df=1, p<.10), but the English caretakers use significantly more S questions at this time (chi squared=4.55, df=1, p<.001), while at Times III and IV in German highly significantly more VP questions are being used (chi squared=26.03, df=1, p<.001 for Time III, chi squared=33.58, df=1, p<.001 for Time IV) with a corresponding higher use of NP questions in English (chi squared=20.15, df=1, p<.001 for Time III, chi squared=14.49, df=1, p<.001 for Time IV).

In addition to this first complexity hierarchy within minimally acceptable responses to tutorial what-questions, i.e. noun phrases before verb phrases before sentences, a second complexity hierarchy has been discussed above, i.e. simple noun phrases before complex ones. In order to investigate the viability of this second instantiation of Corollary Hypothesis B, all NP questions in the data have been analyzed in terms of the relative frequency of occurrence of the following three constituent categories:

Curriculum 2. Categories within NP questions

1) Simple NP (NPS) questions

Within NP questions only, the simplest category of questions in terms of the minimal acceptable response is the type of question which can be answered acceptably with a simple noun phrase consisting of only

a noun in isolation. In addition to the ever-present what's that-question, this question type can take many different shapes, as shown by the following examples:

Examples:

B7, translated from German, Time Period II, Tape #5

Adult: Sean, what does Daddy put in his pipe?

Child: Smoke.

Adult: No, that comes out of it. What . . . with what does Daddy stuff his pipe?

Child: Bacco.

Adult: Yeah, with tobacco. Good. And then, when you light the tobacco, what comes out of the pipe?

Child: Smoke.

Adult: Yes, exactly. That's it.

B8, English, Time Period IV, Tape #14

Adult: What else did you see besides crocodiles?

Child: Oh . . .

Adult: Did you see bears?

Child: Uh-uh.

Adult: D'you see elephants?

Child: Nope.

Adult: Lions?

Child: Yeah lions.

Adult: What about . . . what did the lions do?

Child: De lions make aaah! They make . . . oh, sound.

Adult: What sound did they make?

Child: Yeah.

Adult: Rrrr! Arrr! They roar?

Child: No, they big.

2) Complex NP (NPC) questions

Questions which may not be answered appropriately with a simple noun phrase alone but must be answered with a complex noun phrase which contains, in addition to a head noun, also nominal modification comprise the category of complex NP questions. Such modification could of course take any form, theoretically; in practice, however, it is restricted to prenominal adjectives and compound operators in both the English and the German corpora for the vast majority of these early data. Some examples of questions eliciting such responses are provided in the following:

Examples:

B9, translated from German, Time Period III, Tape #5

Child: Sean lick n geoch ball.

Adult: Sean is licking what kind of a ball?

Child: N ogeange ball.

Adult: The orange ball. Sean is licking the orange ball. Exactly. And what does the orange ball taste like?

Child: Ot good.

Adult: Not good. Well, then you shouldn't lick it any more either.

B10, English, Time Period IV, Tape #6

(talking about "buying food")

Adult: What about Bimbel?

Child: Yeah, yes somefing fo Bimbow too, yeah?

Adult: Yeah. What kind are we going to get Bimbel?

Child: His foot.

Adult: Ah, what kind is that?

Child: Kittyfoot.

Adult: Ah, ok.

Child: Kittyfoot.

Adult: Kittyfood too.

3) Adjective (A) questions

Questions whose response calls for a predicate adjective rather than a predicate noun phrase are included under NP questions in the present analysis. Although there is no difference in terms of syntactic complexity between nouns in isolation and adjectives in isolation, adjectives are assumed here to be more complex in cognitive terms than nouns because their meaningful use depends on the prior establishment of nouns as a linguistic category: An entity must be established and "known", so to speak, before a property can be attributed to it. Examples of adjective questions are provided in the following:

Bil, translated from German, Time Period II, Tape #4

Adult: And on the fifth day he was . . . ? What was he on the fifth day?

Child: Sick.

Adult: Sean, what's that fly there?

Child: Dead.

Adult: Well, you see? And on the fifth day Kasper was dead too. Exactly.

Child: There!

Adult: What is that fly?

Child: Dead.

Adult: Yes. And Kasper, what was he on the fifth day?

Child: Sick.

Adult: No, dear, he was dead too.

Child: Dead.

Adult: Right. Dead, dead, dead.

B12, English, Time Period IV, Tape #12

Adult: What color is your hair, Sean?

Child: I don' know.

Adult: Blond!

Child: Oh!

Adult: Blond hair?

Child: Like . . . like na colu Seevie.

Adult: Stevie?

Child: Yeah, Seevie has blont haiow.

Adult: Like Sean?

Child: Yeah like me.

Adult: Mm-hmm.

The null hypothesis again would predict random distribution of these categories throughout the four time periods. On the other hand, given the combination of syntactic and cognitive complexity for constituents of different noun phrases discussed above, the tutoring hypothesis would predict a shift over time from a predominant use of NPS questions in early tutoring to an ever increasing employment of NPC and/or A questions because both the latter are more complex than the former.

The distribution of categories within NP questions in terms of raw data is given in Table 5. Percentages of use of different categories at different time periods are provided in Table 6, which is converted into graphic information in Figure 3.

[Insert Tables 5 and 6 and Figure 3 approximately here.]

Once more the tutoring hypothesis is supported by the data in that a systematic shift away from NPS questions toward NPC and/or A questions proves highly significant for both corpora (chi squared=79.25, df=6, p<.001 for German, chi squared=104.40, df=6, p<.001 for English). On the other hand, and similar to the investigation of tutorial what-questions as a whole, there again are also substantial differences across languages starting at Time II, although both sets of caretakers follow the same basic shift away from NPS questions: At Time II the German data exhibit a significantly higher relative frequency of NPC questions (chi squared=21.52, df=1, p<.001) and a very nearly significantly higher relative frequency of A questions (chi squard=3.71, df=1, p<.10), which correspond to a significantly higher relative frequency of NPS questions in English (chi squared=26.03, df=1, p<.001). At Time III the German caretaker still uses NPC questions with significantly higher relative frequency than the English caretakers (chi squared=4.03, df=1, p<.05). Finally, at Time IV the relative occurrence of A questions is significantly higher in English than in German (chi squared=9.82, df=1, p<.005). Overall, while the employment of NPC questions lags behind by about one time period in English as compared to German, the use of predicate adjective questions is genuinely different in the two languages: In German the use of such questions peaks early (Time II) and subsequently declines, while in English these questions do not peak until Time IV.

Regardless of these differences, however, both the preceding analyses of caretaker questions in terms of the syntactic complexity of the minimally acceptable response to the question show a systematic progression over time from the simple to the more and more complex.

This is indicative of a well-defined curriculum being introduced by caretaker questions which would allow the child to build, in his responses, larger constituents out of smaller parts learned and practiced at an earlier time: verb phrases out of verbs and earlier established noun phrases, sentences out of earlier established noun phrases and verb phrases, and complex noun phrases out of modifiers and earlier established nouns. This succession of different question types found in both corpora, therefore, strongly supports the hypothesis of systematic and deliberate language tutoring on the part of these caretakers, although the differences between languages indicate that such tutoring might have progressed at different rates in German and English.

A third corollary hypothesis with respect to the nature of caretaker questions would follow from the general assumption of deliberate language tutoring. Effective language teaching should be concerned not only with learners' linguistic production but also with their comprehension abilities and should increase over time the task demand also with respect to the latter. If the basic goal of language instruction is the establishment of communicative competence in the learner, he must gradually be lead away from simple formulaic questions used in early tutoring toward the understanding of a wide variety of different questions used in everyday conversation among fluent speakers of a language. At some point understanding a complex question correctly will be of equally high importance as responding to a simple question correctly. The tutoring hypothesis therefore predicts the following Corollary Hypothesis C:

> Not only should a curriculum be followed with respect to the minimally acceptable response to a question, but also the form of the questions themselves should follow a similar curriculum in that questions containing lexical verbs (i.e. true verb

phrases) should replace questions containing the copula over time. This would mean that questions not only would become more complex in terms of ease of comprehension but also that an earlier part of the curriculum would have become incorporated into the means for testing and practicing a later part of the curriculum.

Since VP questions and S questions never contain the copula in the first place, the examination of data with respect to this third corollary hypothesis must again be based on NP questions exclusively. All NP questions are consequently subdivided into the following two categories:

1) Copula (C) questions

This categorie comprises all NP questions which, implicitly or explicitly, contain a form of the verb be as a copula; this means only questions employing be in its predicational use rather than in its possible use as an auxiliary verb are categorized as C questions. Some examples provided earlier, i.e. A1, A2, B1, B2, B11, and B12, fall into this category.

2) Verb (V) questions

NP questions which contain any lexical verb, i.e. verbs other than copula be, regardless of whether they are predicational or not, are categorized as V questions. This means that this category would contain even questions containing other predicational verbs, which function similar to copular be, like seem or get (in it's meaning of "become"). Examples provided earlier which exemplify this category are B7, B8, B9, and B10.

The distribution of questions according to these two categories at the four different time periods under investigation is shown in Table 7 in terms of raw numbers and in Table 8 in terms of percentages of use per time period per language. The information provided in Table

8 is presented in graphic form in Figure 4.

[Insert Tables 7 and 8 and Figure 4 approximately here.]

As was the case in prior analyses, the null hypothesis, i.e. that different question types are distributed randomly in caretaker speech, is contadicted by the data. On the contrary, these data show that both sets of caretakers systematically shift from the nearly exclusive use of copula questions at Time I to a majority of questions containing a wide variety of other verbs at Time IV; this general shift over time is highly significant in both languages (chi squared=177.78, df=3, $p<.001$ for German, chi squared=192.31, df=3, $p<.001$ for English). However, the rate of the shift again proves different agross languages in that the relative frequency of presentation by the adults of more complex structures, i.e. verb questions, is significantly higher in German than in English at Times II and III (chi squared=79.08, df=1, $p<.001$ for Time II, chi squared=31.66, df=1, $p<.001$ for Time III).

With respect to the demands put on the child's ability to comprehend the questions he is asked by his caretakers, then, a definite progression is found once more in both corpora from formula-like copula questions, whose comprehension does not present any challenge to the child, to questions approaching something very much akin to normal adult conversational interaction, whose comprehension requires knowledge of the linguistic representation of many different actions, happenings, and states. However, the more complex V questions are introduced later in English than they are in German, a result similar to those found in earlier analyses.

The preceding analyses of <u>what</u>-questions posed by his caretakers in his two languages to the bilingual child Sean has yielded a number of observations which, taken together, strongly support the tutoring

hypothesis.

Initially it was shown that what-questions probably should not be subdivided into those two categories which had previously been assumed by most scholars (e.g. Olsen-Fulero and Conforti 1983), namely on the one hand questions which function to test children's knowledge and to which the answer is known to the caretaker in advance, and, on the other hand, questions which function to "communicate" with the child by requesting "real" information from him. The present investigation rather suggests that a different basic division of caretaker questions into those that are tutorial, i.e. function as structural pattern drills, versus those that request real information from the child not for the sake of communication but in order to find out how best to accommodate him, might be more revealing with respect to the functions of what-questions in child-directed speech. It appears that caretakers could not indeed be seriously interested in the majority of trivial and sometimes even nonsensical information, from an adult point of view, which they consistently elicit from the little language-learner. If a large majority of at least what-questions in adult-child linguistic interaction is examined from the point of view of true communication, i.e. the exchange of information, it is seen that communication does not take place, because generally, if any information is conveyed at all by such discourses, it is conveyed only unidirectionally, from adult to child. This majority of what-questions is therefore suggested to be tutorial rather than "communicational", even if the questioning adult does not know the exact answer to her question in advance.

This assumption is strengthened by the subsequent observation that by means of such tutorial questions, whose content initially is concerned with the here and now and whose answers are thereby cued at least implicitly by the situation, if not explicitly by the caretaker herself, the child apparently is taught first how "things" are called,

then how to express "goings-on" by verbal means, and finally how to encode linguistically a full event, in which somebody or something is involved in a "going-on", ie. the caretakers' questions are geared toward the child's production of noun phrases first, then of verb phrases, and finally of full sentences. Within those questions geared toward his production of noun phrases, furthermore, basic "thing"-expressions are introduced before they either are subcategorized or modified, or before properties are attributed to them. In this manner the adults' questions require the child's production of simple noun phrases before he is asked to produce either complex noun phrases or predicate adjectives. And superimposed on these two independent but parallel curricula both sets of caretakers gradually shift from questions whose answers are cued by the situation as well as known by the tutor, who therefore can consistently check their accuracy, to questions which leave the child without cues provided by the immediate situation and with only suggestions for possible answers, not provisions of correct ones, from a tutor who now forces the little student, by switching from meaningful to communicative drills, to apply the knowledge previously gained through routine interactions to more and more diverse contexts.

It is with respect to this shift from strictly tutorial to loosely tutorial questions that the most striking likeness between the German and English input corpora is observed. In fact, the use of loosely tutorial what-questions hardly differs at all in the two corpora, neither in terms of relative distribution over time with respect to other categories of questions nor even in terms of actual numbers of questions at any of the time periods. Such an incredible likeness with respect to this particular set of questions, i.e. loosely tutorial ones, in the speech of different caretakers in German and English, and a progression similar to that of the German adult across a number of

different babysitters over time within the English data to the same child, should probably be considered an effect of the child on the adults.

A possible explanation for these similarities across caretakers in the employment of loosely tutorial questions in terms of the child's cognitive development is the following: As I have shown in an experimental study of Sean's comprehension of passive questions at age two-and-a-half (Forner 1977), apparently a child's processing of a question is influenced by differential task difficulties of questions referring to the here and now, for which the answer can be read off the situation immediately, and questions which require the reconstruction of their propositional content from memory while situational support is not provided. It was suggested that a child may answer a question incorrectly in the second situation not because he didn't understand it or because he doesn't know the answer, but because the question itself might be retrieved from short-term memory as a different one if it is necessary to store it for a longer period of time while trying to remember the situation to which the propositional content of the question refers.

A child thus might cue the caretaker, through a decrease in incorrect responses, about his increasing ability to remember a question correctly while also remembering the situation it refers to, i.e. to remember two different things at the same time. If susceptible to such cueing, the caretaker can at the same rate as this ability increases increase her own incidence of questions not based on the immediate situation at hand. Although the adult would base her judgment on a linguistic variable, namely the child's apparent comprehension of questions in deferred contexts, the equivalence in the increase in loosely tutorial questions in the two sets of caretakers' inquiries thus could ultimately be viewed as an effect on both sets of caretakers

equally of a purely cognitive variable, namely the child's growing memory capabilities.

In addition to this equivalence of the two corpora with respect to questions referring to deferred contexts, very strong parallels are also observed between Sean's input questions in his two languages in terms of their structural properties. With the exception of questions about predicate adjectives, whose occurrence over time was found to be genuinely different in the two corpora, both sets of caretakers systematically adhere to the same two curricula, which seem to be graded according to the increasing complexity of the answers necessary to appropriately respond to their questions. On the one hand, the child has to supply noun phrases before verb phrases before sentences. On the other hand, he has to provide simple noun phrases before complex ones. These findings not only suggest a definite awareness by all the caretakers of the relative complexity of these different constituents but also support the hypothesis that both sets of adults indeed were attempting to test, by means of these questions, the child's production of "grammatical strings from a miniature language" (Levelt 1975) through the same "systematic supporting curriculum" which introduces "one new construction at a time" and moves "from the simple to the complicated" (Newport et al. 1977).

However, although the curriculum as such is the same in both languages, significant differences were found between languages in terms of its application. These consist to a large extent of a much stronger emphasis on VP questions on the part of the German adult. This is true in numerical terms as well as in the relatively earlier introduction of VP questions in German with a corresponding longer adherence to NP questions in English. Similarly, a significantly earlier relative use of true verb questions in German and a corresponding longer adherence to copula questions in English was also

observed, and differences were found with respect to a significantly earlier shift from simple NP questions to complex ones in German. In fact, in terms of the relative frequency of NP questions versus VP questions, simple NP questions versus complex ones, and copula questions versus true verb questions, the English data consistently lag behind the German data by approximately three months, i.e. by one time period. These differences, however, generally start only at Time II or III, while significant differences between the English and the German corpora at Time I are found only very rarely.

Although these differences cannot be explained at the present time, some suggestions as to their origin present themselves:

The tutoring hypothesis predicts that the introduction of any complex structure would have to depend on the child's relative mastery of the preceding simpler ones because more complex material would not be introduced until the student is "ready" to process it. If therefore the adults indeed were tutoring the child, they should be aware of what kinds of questions he could possibly answer at any given point in time and would not proceed to the next higher level in the curriculum until he had proven his proficiency at the current level. Within a tutorial model, then, these time lags could be explained under the assumption that the child's language development in German was generally more advanced than his development in English by approximately three months. Furthermore, this assumption would have to be made not only in terms of his production, in order to explain the difference across languages between NP and VP questions and simple and complex NP questions, to which the required <u>answers</u> vary in complexity, but also in terms of his comprehension, in order to explain the difference across languages between noun phrase questions containing the copula and noun phrase questions containing other verbs, for which the required response is the same but which vary in terms of the complexity of the <u>question</u>

itself in that the latter refer to a variety of full propositions whose analysis requires knowledge of grammatical relations, while the former only refer to predications.

According to the tutoring hypothesis, then, the delayed introduction by the caretakers of more complex questions in English should be due to a time lag in the production of more complex structures by the child in that language. However, the tutoring hypothesis also predicts that the child's language development itself should be dependent on the kind of input he receives. After all, a tutor does not only have to test, she also has to teach. Both the adults' and the child's productions, therefore, will have to be scrutinized in order to test the suggestions advanced here on the basis of the tutoring hypothesis concerning the child's overall rate of development in the two languages.

While the ultimate question, namely whether or not a child's linguistic progress is affected by adult language-tutoring behavior, will thus have to wait for further detailed investigations of possible correlations between input and output, the present study has opened a door to such investigations. By deliberately limiting the data base to only a subset of the total verbal interaction between caretaker and child on the basis of the assumption of true tutoring intentions on the part of caretakers, it was possible to observe inequivocally clear instances of continuous and systematic progression from simple to complex on a number of different dimensions, some of them syntactic, in at least one aspect of the language addressing the young language learner, namely in the questions which he is asked. The same systematic progression, furthermore, was present in the speech of two rather different sets of caretakers completely independently, caretakers which differed not only in the language they spoke with the child but also in their linguistic sophistication and very possibly

also in their motivation to teach the child. Despite these differences, however, the same trivial information was elicited, the same formulaic question types were used, and the same easy questions were replaced by the same more difficult ones over time in the corpora of both sets of caretakers: Adults indeed appear to "try to teach children to talk."

REFERENCES

Broen, P. (1972). The verbal environment of the language learning child. American Speech and Hearing Monographs No.17.

Brown, R. (1977). Introduction. In C. E. Snow & C. A. Ferguson (eds), Talking to children: Language input and acquisition. Cambridge, England: Cambridge University Press.

Bynon, J. (1968). Berber nursery language. Transactions of the Philological Society 107-61.

Bynon, J. (1977). The derivational processes relating Berber nursery words to their counterparts in normal inter-adult speech. In C. E. Snow & C. A. Ferguson (eds), Talking to children: Language input and acquisition. Cambridge, England: Cambridge University Press.

Casagrande, J. B. (1948). Comanche baby language. International Journal of American Linguistics 14. 11-14.

Drach, K. M. (1969). The language of the parent: a pilot study. In K. M. Drach, B. Kobashigawa, C. Pfuderer & D. Slobin (eds), The structure of linguistic input to children. Working Papers No. 14, Language Behavior Research Laboratory, University of California, Berkeley.

Ferguson, C. A. (1977). Baby talk as a simplified register. In C. E. Snow & C. A. Ferguson (eds), Talking to children: language input and acquisition. Cambridge, England: Cambridge University Press.

Forner, M. (1977). Situational determinants of comprehension during language acquisition. In R. L. Brown, K. Houlihan, L. Hutchinson & A. McLeish (eds), Proceedings of the 1976 Mid-America Linguistics Conference. Minneapolis, MN: University of Minnesota.

Forner, M. (1979). The mother as LAD: Interaction between order and frequency of parental input and child production. In F. R. Eckman & A. J. Hastings (eds), Studies in first and second language acquisition. Rowley, Mass.: Newbury House Publishers.

Furrow, D. & Nelson, K. (1986). A further look at the motherese hypothesis: a reply to Gleitman, Newport & Gleitman. Journal of Child Language 13. 163-76.

Hoff-Ginsburg, E. C. (1981). The role of linguistic experience in the child's acquisition of syntax. Ph.D. thesis, University of Michigan.

Holzman, M. (1972). The use of interrogative forms in the verbal interaction of three mothers and their children. Journal of Psycholinguistic Research 1. 311-36.

Hopper, P. J. & Thompson, S. A. (1984). The discourse basis for lexical categories in universal grammar. Language 60. 703-52.

Levelt, W. J. M. (1975). What became of LAD? PdR Press Publications in Cognition 1. Lisse: The Peter deRidder Press.

Lord, C. (1976). Language acquisition and the linguistic environment. Ph.D. thesis, Harvard University.

Maratsos, M. & Chalkley, M. (1980). The internal language of children's syntax. In K. Nelson (ed), Children's language, Vol. II. New York: Gardner Press.

McDonald, L. & Pien, D. (1982). 982. Mother conversational behavior as a function of interactional intent. Journal of Child Language 9. 337-58.

Moerck, E. L. (1976). Processes of language teaching and training in the interactions of mother-child dyads. Child Development 47. 1064-78.

Nelson, K. (1973). Structure and strategy in learning to talk. SRCD Monographs, Vol. 38, No.1-2.

Newport, E. L. (1977). Motherese: the speech of mothers to young children. In N. J. Castellan Jr., D. B. Pisoni & G. R. Potts (eds), Cognitive theory, Vol. 2. Hillsdale, NJ: Lawrence Erlbaum Associates.

Newport, E. L., Gleitman, H. & Gleitman, L. R. (1977). Mother, I'd rather do it myself: Some effects and non-effects of maternal speech style. In C. E. Snow & C. A. Ferguson (eds), Talking to children: Language input and acquisition. Cambridge, England: Cambridge University Press.

Olsen-Fulero, L. & Conforti, J. (1983). Child responsiveness to mother questions of varying type and presentation. Journal of Child Language 10. 495-520.

Paulston, C. B. & Bruder, M. N. (1976). Teaching English as a second language: Techniques and procedures. Cambridge, Mass.: Winthrop.

Remick, H. (1976). Maternal speech to children during language acquisition. In W. von Raffler-Engel & Y. Lebrun (eds), Baby talk and infant speech. Lisse, Netherlands: Swets.

Sachs, J., Brown, R. & Salerno, R. (1976). Adults' speech to children. In W. von Raffler Engel & Y. Lebrun (eds), Baby talk and infant speech. Lisse, Netherlands: Swets.

Savic, S. (1975). Aspects of adult-child communication: the problem of question acquisition. Journal of Child Language 2. 251-60.

Sheldon, A. L. (1979). Assumptions, methods and goals in language acquisition research. In F. R. Eckman & A. J. Hastings (eds), Studies in first and second language acquisition. Rowley,

Mass.: Newbury House Publishers.

Slobin, D. I. (1973). Cognitive prerequisites for the development of grammar. In C. A. Ferguson & D. I. Slobin (eds), Studies of child language development. New York: Holt, Rinehart and Winston.

Snow, C. E. (1972). Mothers' speech to children learning language. Child Development 43. 549-65.

Snow, C. E. (1976). The conversational context of language acquisition. Paper presented at the NATO Conference on the Psychology of Language, University of Sterling, June.

Snow, C. E., Arlmann-Rupp, A., Hassing, Y., Jobse, J., Jooste, J. & Vorster, J. (1976). Mothers' speech in three social classes. Journal of Psycholinguistic Research 5. 1-20.

APPENDIX

Table 1. What-question Episodes; Adults, Raw Data

	German Adult (GA)				English Adult (EA)			
	ST	LT	NT	Total	ST	LT	NT	Total
Time I	287	19	18	324	175	20	21	216
Time II	446	38	23	507	413	49	19	481
Time III	342	123	19	484	285	99	13	397
Time IV	271	175	18	464	273	149	10	432
Total	1346	355	78	1779	1146	317	63	1526

Table 2. What-question Episodes; Adults, Percentages

	GA			EA		
	ST	LT	NT	ST	LT	NT
Time I	88.58	5.86	5.56	81.02	9.26	9.72
Time II	87.97	7.50	4.54	85.86	10.19	3.95
Time III	70.66	25.41	3.93	71.79	24.94	3.27
Time IV	58.41	37.72	3.88	63.19	34.49	2.31

Table 3. Tutorial Questions Total; Adults, Raw Data

	GA				EA			
	NP	VP	S	Total	NP	VP	S	Total
Time I	276	25	5	306	170	18	7	195
Time II	391	80	13	484	380	57	25	462
Time III	269	127	69	465	279	50	55	384
Time IV	254	130	62	446	293	55	74	422
Total	1190	362	149	1701	1122	180	161	1463

Table 4. Tutorial Questions Total; Adults, Percentages

	GA			EA		
	NP	VP	S	NP	VP	S
Time I	90.20	8.17	1.63	87.18	9.23	3.59
Time II	80.78	16.53	2.69	82.25	12.34	5.41
Time III	57.85	27.31	14.84	72.66	13.02	14.32
Time IV	56.95	29.15	13.90	69.43	13.03	17.54

Table 5. NP Questions, Function; Adults, Raw Data

	GA				EA			
	NPS	NPC	A	Total	NPS	NPC	A	Total
Time I	275	1	0	276	168	0	2	170
Time II	322	54	15	391	358	16	6	380
Time III	208	55	6	269	227	39	13	279
Time IV	190	56	8	254	208	56	29	293
Total	995	166	29	1190	961	111	50	1122

Table 6. NP Questions, Function; Adults, Percentages

	GA			EA		
	NPS	NPC	A	NPS	NPC	A
Time I	99.64	0.36	0.00	98.82	0.00	1.18
Time II	82.35	13.81	3.84	94.21	4.21	1.58
Time III	77.32	20.45	2.23	81.36	13.98	4.66
Time IV	74.80	22.05	3.15	70.99	19.11	9.90

Table 7. NP Questions, Form; Adults, Raw Data

	GA			EA		
	C	V	Total	C	V	Total
Time I	232	44	276	150	20	170
Time II	207	184	391	315	65	380
Time III	107	162	269	178	101	279
Time IV	77	177	254	111	182	293
Total	623	567	1190	754	368	1122

Table 8. NP Questions, Form; Adults, Percentages

	GA		EA	
	C	V	C	V
Time I	84.06	15.94	88.24	11.76
Time II	52.94	47.06	82.89	17.11
Time III	39.78	60.22	63.80	36.20
Time IV	30.31	69.69	37.88	62.11

Figure 1.

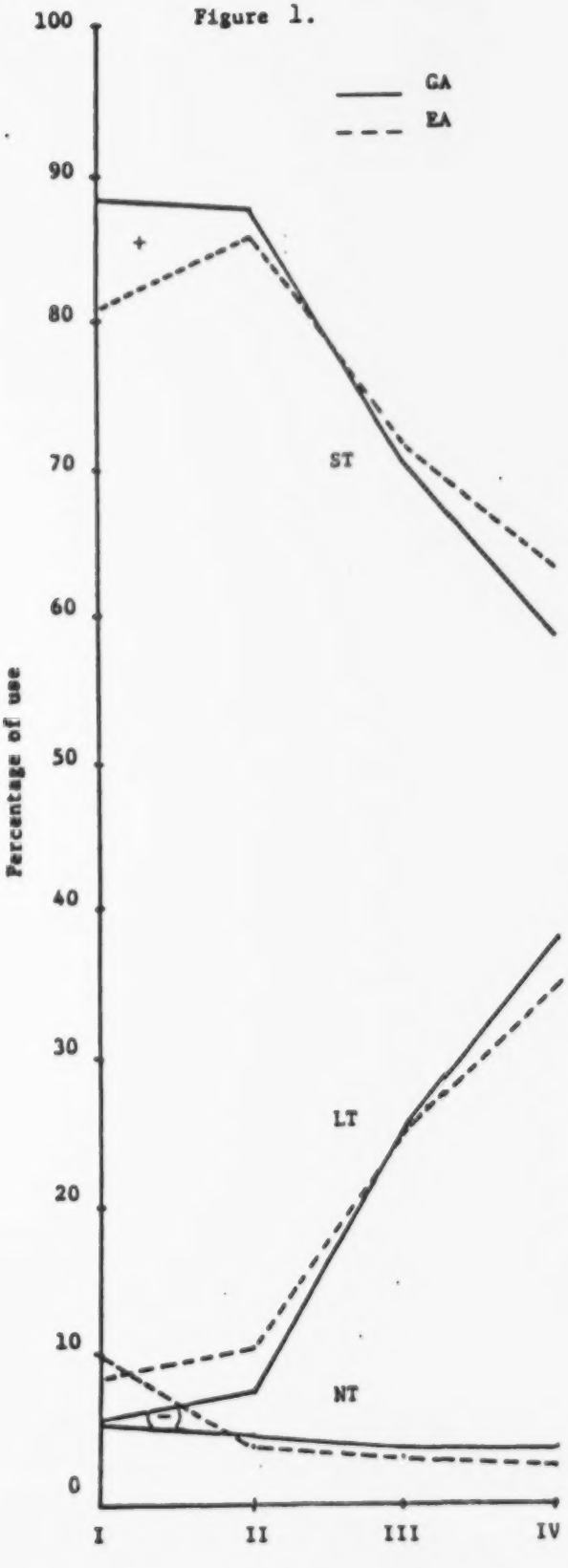

GA
EA
100
90
80
70
60
50
40
30
20
10
0
Percentage of use
+
ST
LT
NT
-
I
II
III
IV

Figure 2.

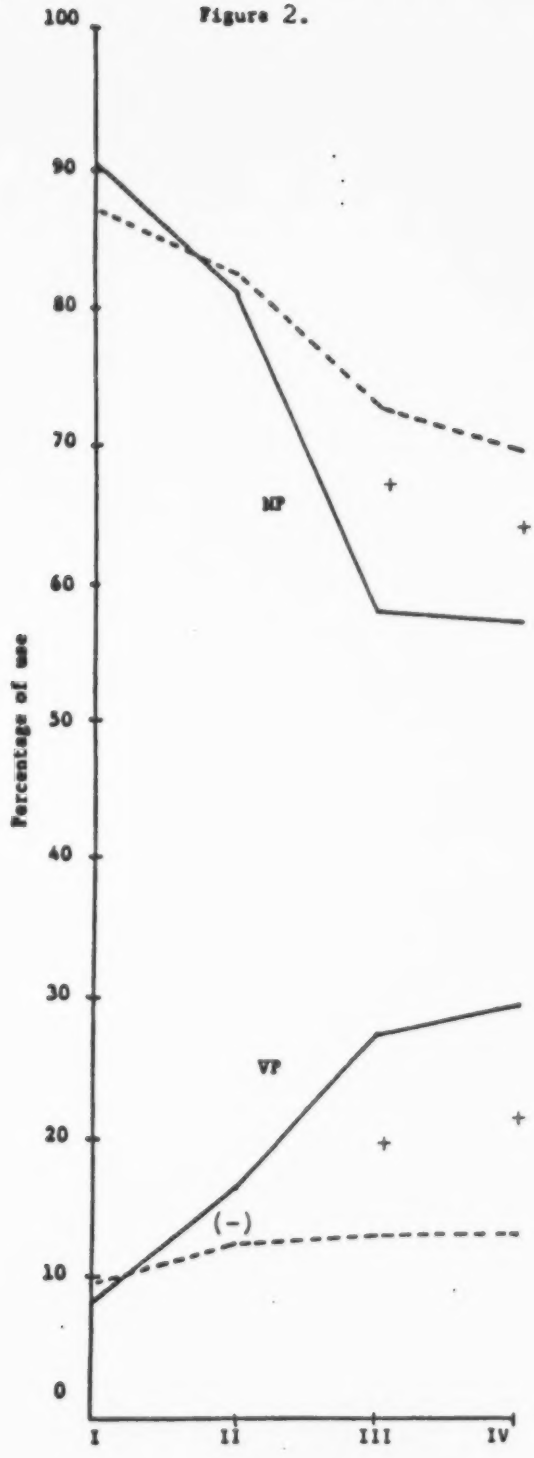


Figure 2.a.

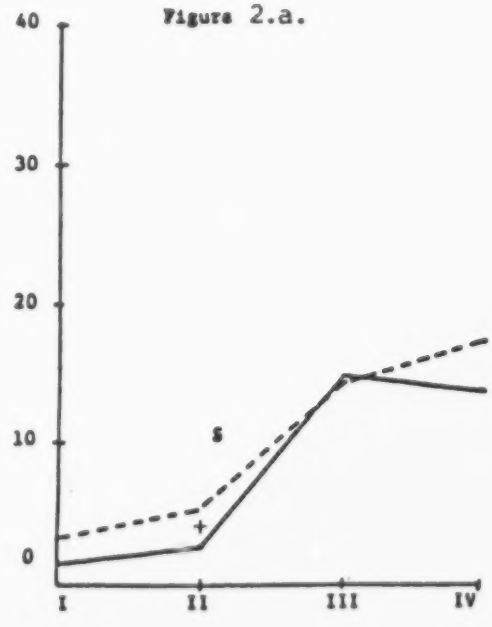


Figure 3.

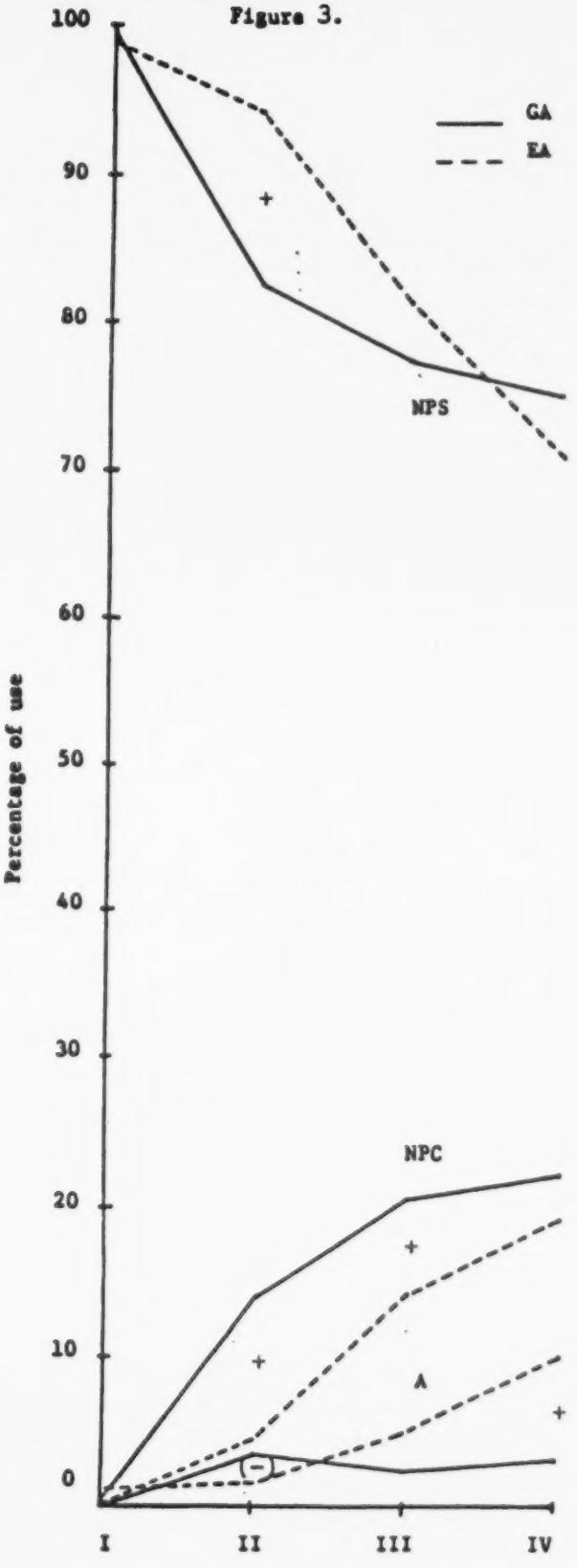
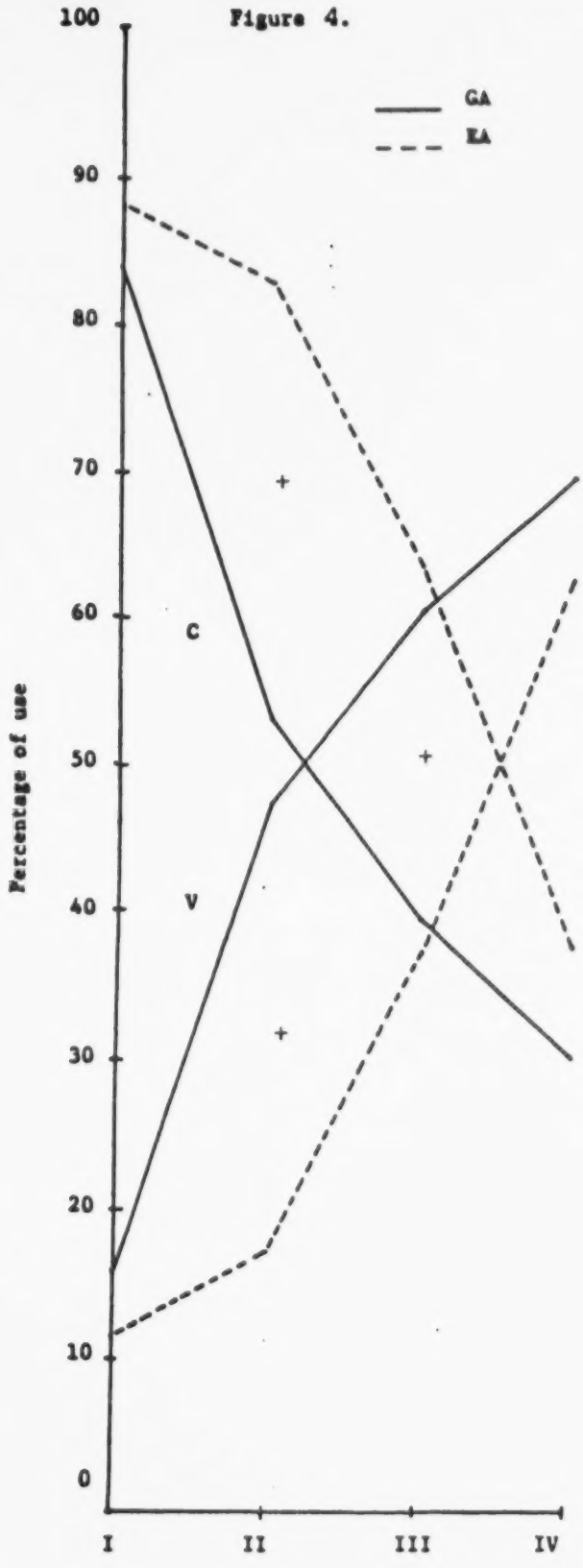

100
90
80
70
60
50
40
30
20
10
0
Percentage of use
GA
EA
NPS
NPC
A
I
II
III
IV

Figure 4.


100
90
80
70
60
50
40
30
20
10
0
Percentage of use
GA
EA
C
V
I
II
III
IV